

WHAT IS CLAIMED IS:

1 1. A resource allocator operable to allocate a plurality of
2 resources among a plurality of tasks within a process system, the
3 process system capable of executing at least one application
4 process, the resource allocator comprising:

5 a monitoring controller operable to monitor one or more
6 characteristics associated with the at least one application
7 process, the resources, and the tasks;

8 a model of the process system representing mathematically the
9 resources and the tasks and defining relationships among related
10 ones of the resources and the tasks as a function of the at least
11 one application process;

12 a resource allocation controller operable to operate the model
13 in response to ones of the monitored characteristics and allocate
14 ones of the resources among ones of the tasks to execute the at
15 least one application process; and

16 a graphical user interface operable to identify the resources
17 and flows between at least some of the resources, the graphical
18 user interface comprising at least one virtual queue associated
19 with at least one of the resources and identifying one or more
20 items to be processed by the at least one resource.

1 2. The resource allocator of Claim 1, wherein:

2 the resources comprise one or more wet decks and one or more
3 furnaces, the one or more furnaces comprising at least one vertical
4 polysilicon furnace; and

5 one virtual queue is associated with the at least one vertical
6 polysilicon furnace, the one or more items identified in the
7 virtual queue comprising a plurality of semiconductor wafer lots to
8 be run through the at least one vertical polysilicon furnace.

1 3. The resource allocator of Claim 2, wherein the virtual
2 queue identifies a recipe associated with each semiconductor wafer
3 lot, a number of semiconductor wafers in each semiconductor wafer
4 lot, and a latest time when each semiconductor wafer lot should be
5 provided to the at least one vertical polysilicon furnace.

1 4. The resource allocator of Claim 3, wherein the virtual
2 queue is associated with a spreadsheet, the spreadsheet comprising
3 additional information about the semiconductor wafer lots.

1 5. The resource allocator of Claim 2, wherein the graphical
2 user interface comprises:

3 a first portion identifying at least two types of
4 semiconductor wafers to be processed; and

5 a second portion identifying the one or more wet decks, one or
6 more furnaces, and flows of semiconductor wafer lots between at
7 least some of the one or more wet decks and the one or more
8 furnaces, the second portion comprising the virtual queue.

1 6. The resource allocator of Claim 1, wherein the first
2 portion comprises a plurality of buckets, each bucket associated
3 with one type of item to be processed by the resources, each bucket
4 identifying a plurality of time periods and a number of items to be
5 processed during each of the time periods.

1 7. The resource allocator of Claim 6, wherein each bucket is
2 associated with a spreadsheet, the spreadsheet comprising
3 additional information about the items of the associated item type
4 to be processed.

1 8. The resource allocator of Claim 1, wherein the second
2 portion comprises a plurality of objects, each object associated
3 with one of the resources, at least two different types of
4 resources associated with objects of different shapes.

1 9. The resource allocator of Claim 8, wherein at least one
2 object has at least one of an associated color and an associated
3 shading that identifies a status of the resource associated with
4 the object.

1 10. The resource allocator of Claim 8, wherein at least one
2 object identifies a number of items being processed by the resource
3 associated with the object and a number of the items to be provided
4 to the resource associated with the virtual queue.

1 11. A method for allocating a plurality of resources among a
2 plurality of tasks within a process system, the process system
3 capable of executing at least one application process, the method
4 comprising:

5 monitoring one or more characteristics associated with the at
6 least one application process, the resources, and the tasks;

7 modeling the process system to represent mathematically the
8 resources and the tasks and to define relationships among related
9 ones of the resources and the tasks as a function of the at least
10 one application process;

11 operating the model in response to ones of the monitored
12 characteristics and allocating ones of the resources among ones of
13 the tasks to execute the at least one application process; and

14 generating a graphical user interface operable to identify the
15 resources and flows between at least some of the resources, the
16 graphical user interface comprising at least one virtual queue
17 associated with at least one of the resources and identifying one
18 or more items to be processed by the at least one resource.

1 12. The method of Claim 11, wherein:

2 the resources comprise one or more wet decks and one or more
3 furnaces, the one or more furnaces comprising at least one vertical
4 polysilicon furnace; and

5 one virtual queue is associated with the at least one vertical
6 polysilicon furnace, the one or more items identified in the
7 virtual queue comprising a plurality of semiconductor wafer lots to
8 be run through the at least one vertical polysilicon furnace.

1 13. The method of Claim 12, wherein the virtual queue
2 identifies a recipe associated with each semiconductor wafer lot, a
3 number of semiconductor wafers in each semiconductor wafer lot, and
4 a latest time when each semiconductor wafer lot should be provided
5 to the at least one vertical polysilicon furnace.

1 14. The method of Claim 13, further comprising opening a
2 spreadsheet in response to user input, the spreadsheet associated
3 with the virtual queue and comprising additional information about
4 the semiconductor wafer lots.

1 15. The method of Claim 12, wherein the graphical user
2 interface comprises:

3 a first portion identifying at least two types of
4 semiconductor wafers to be processed; and

5 a second portion identifying the one or more wet decks, one or
6 more furnaces, and flows of semiconductor wafer lots between the
7 one or more wet decks and the one or more furnaces, the second
8 portion comprising the virtual queue.

1 16. The method of Claim 11, wherein the first portion
2 comprises a plurality of buckets, each bucket associated with one
3 type of item to be processed by the resources, each bucket
4 identifying a plurality of time periods and a number of items to be
5 processed during each of the time periods.

1 17. The method of Claim 16, further comprising opening a
2 spreadsheet associated with one of the buckets in response to user
3 input, the spreadsheet comprising additional information about the
4 items of the associated item type to be processed.

1 18. The method of Claim 11, wherein the second portion
2 comprises a plurality of objects, each object associated with one
3 of the resources, at least two different types of resources
4 associated with objects of different shapes.

1 19. The method of Claim 18, wherein:
2 at least one object has at least one of an associated color
3 and an associated shading that identifies a status of the resource
4 associated with the object; and
5 at least one object identifies a number of items being
6 processed by the resource associated with the object and a number
7 of the items to be provided to the resource associated with the
8 virtual queue.

1 20. A computer program embodied on a computer readable medium
2 and operable to be executed by a processor, the computer program
3 comprising computer readable program code for generating a
4 graphical user interface, the graphical user interface comprising:

5 a first portion identifying at least two types of
6 semiconductor wafers to be processed by at least one of one or more
7 wet decks and one or more furnaces, the one or more furnaces
8 comprising at least one vertical polysilicon furnace; and

9 a second portion identifying the one or more wet decks, the
10 one or more furnaces, and flows of semiconductor wafer lots between
11 the one or more wet decks and the one or more furnaces;

12 the second portion comprising at least one virtual queue
13 operable to identify one or more semiconductor wafer lots to be
14 processed by the at least one vertical polysilicon furnace.

1 21. The computer program of Claim 20, wherein the virtual
2 queue identifies a recipe associated with each semiconductor wafer
3 lot, a number of semiconductor wafers in each semiconductor wafer
4 lot, and a latest time when each semiconductor wafer lot should be
5 provided to the at least one vertical polysilicon furnace.

1 22. The computer program of Claim 21, further comprising
2 computer readable program code for providing a spreadsheet in
3 response to user input, the spreadsheet associated with the virtual
4 queue and comprising additional information about the semiconductor
5 wafer lots.

1 23. The computer program of Claim 20, wherein the first
2 portion comprises a plurality of buckets, each bucket associated
3 with one type of semiconductor wafer to be processed by the one or
4 more wet decks and the one or more furnaces, each bucket
5 identifying a plurality of time periods and a number of
6 semiconductor wafers to be processed during each of the time
7 periods.

1 24. The computer program of Claim 23, further comprising
2 computer readable program code for providing a spreadsheet
3 associated with one of the buckets in response to user input, the
4 spreadsheet comprising additional information about at least some
5 of the semiconductor wafers to be processed.

1 25. The computer program of Claim 20, wherein the second
2 portion comprises a plurality of objects, each object associated
3 with one of the wet decks or furnaces, wherein one or more objects
4 associated with the one or more wet decks have a different shape
5 than one or more objects associated with the one or more furnaces.

1 26. The computer program of Claim 25, wherein:
2 at least one object has at least one of an associated color
3 and an associated shading that identifies a status of the wet deck
4 or furnace associated with the object; and
5 at least one object identifies a number of semiconductor
6 wafers being processed by the furnace associated with the object
7 and a number of those semiconductor wafers to be provided to the at
8 least one vertical polysilicon furnace.